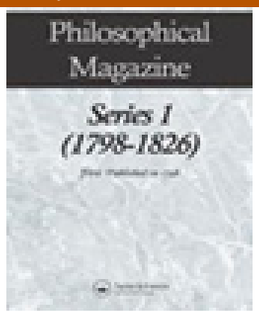

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XVI. *Proposal for a new System of Building Houses, Streets, &c. By* G. FIELD, *Esq.*

To Mr. Tilloch.

SIR,

THE analogy between the following essay and an ingenious paper which I have lately seen "On the Figure in which Trees should be disposed in Plantations," (quoted in No. 7 of the Retrospect, from the Farmer's Magazine, No. 28,) and their dependance on the same principles, have induced me to resume my essay, which is connected with a more extensive design, and has lain-by several years, and to publish it through your Magazine, with which I consider it more compatible than with either of the above.

The author of the paper I have mentioned has demonstrated that the most advantageous distribution of trees in a plantation is hexangular, because he has observed in nature "*that mature strong trees, which have arisen from the seed of any one tree, will be found nearly in the angles of an equilateral and equiangular hexagon, with the original tree in the centre*;" and because "*the closest order in which it is possible to place a number of points upon a plane surface, not nearer than a given distance from each other, is the angles of hexagons, with a point in the centre of each hexagon.*" (See Euclid, book iv. prop. 15.)

In nature it may be observed also *that the general form of trees is circular, their branches diverging in radii from their trunks as centres, and that nature distributes their offspring in circles around the parent trees.* It may be also rationally or mathematically proved *that the closest arrangement of circles on a plane is in hexagons*; and these are the points of union and coincidence by which an easy transition is made from the subject of the above paper to that of the present essay; coincidences arrived at, probably, by very different routes, and strongly presumptive of the same foundation in nature and truth.

On the general Application of the circular Form in Architecture.

" Order is Heav'n's first law."
Pope's Essay on Man.

It is notorious that the rough proportion of the diameter to the circumference of a circle is as 7 to 22, rather exceeding 1 to 3. If, therefore, we draw a line AB (fig. 5. Pl. III.) three times the length of the diameter of a circle C, allowing $\frac{1}{12}$ diameter for deficiency, and divide this line into four equal parts, we have the measure of the four sides of a square D, equal to the circumference of the circle C.

It is evident, therefore, that *the circle circumscribes a much greater area than the square, at the same time that its extremities lie nearer together*; that therefore the circle is of the two the most eligible form for a building in general; and that, whatever be the materials used for erecting the walls, less of them will be required for a circular than for a square edifice of equal dimensions; consequently, a considerable saving of materials.

To these may be added the following considerations and advantages depending on the general properties of the circle:

That of all forms of building, the circular is the most simple, the most durable, and the strongest.

That for beauty and sublimity it is far superior to other forms, presenting one endless front (whatever is bounded being little to the imagination, the power of which is infinite); and it is susceptible of all the variety of architectural decorations in arcades, colonnades, domes, porticos, &c.

That the view from a circular edifice is much more extensive than from a square building, no angles intercepting the sight from the windows, &c., while the light entering laterally at the windows, enlivens the dark piers between them.

That structures of this form may be raised upon the principle

ciple of the *cask*, and the materials formed into girders or *hoops* resting on each other, so as to render it impossible either to force its walls in or out; and hence the greatest strength with the least consumption of materials.

That as *hoops* may be formed of the materials to connect the parts of a building with firmness, so, to apply the idea of the cask further, *staves* may be framed of wood or other materials (fig. 2.), to be connected by hoops or bolts, and the openings, except such as may be required for doors and windows, may be pannelled, plastered, or bricked up.

Thus, large structures of great strength, durability, and lightness (and portable buildings), may be framed at the least expense, for barns, manufactories, &c., while the face of the country would be rendered extremely picturesque and beautiful thereby, covered, as it were, with temples.

That the natural form of covering or roof for a circular building is the *dome*, which may also be constructed on the principle of the cask to any extent, or of hoops or rings diminishing upwards and resting on each other, extremely light, durable, and strong.

That the dome is the best form of roof for resisting all kinds of weather, requiring no other support than it has intrinsically; and hence it is a hollow structure affording space for rooms which in other roofs is occupied by timbers, and therefore requires less materials, while the dome is acknowledged to be both externally and internally extremely beautiful; the only form of roof, perhaps, that is so; whence other roofs have been purposely hidden by the walls, giving to edifices the appearance of mere inclosures.

That the distribution of the timbers of the floors according to fig. 3. would save timber and give great stiffness and solidity to the floors, as the shorter timbers would require a proportionably less diameter, and the divisions of the house into apartments may rest upon and support the timbers. Or, if required, the floors may be more strongly and flatly vaulted with masonry than in other forms of building, owing to the power of supporting lateral pressure in walls built upon the principle I have suggested; and the ceilings might be

formed into shells, fans, &c., providing at once safeness from fire, durability, strength, and beauty.

That the stairs may be disposed with great advantage in the centre of the building (fig. 1. F), affording the readiest communication to all parts of the house, lighted from the top of the dome by a lantern of the most simple or beautiful form; while the well, spiral, or circular staircase is confessedly the most beautiful and the strongest. In these latter particulars, however, there is the greatest latitude for variation to which fancy, convenience, or even prejudice, may prompt: nor is it necessary in a mere sketch to show how the apartments may be laid out, the stairs and passages disposed, the fireplaces and chimneys arranged, ventilation carried on, or water conducted, &c. throughout this form of building; suffice it that it is susceptible of all the variation of other buildings in these respects, and with some peculiar advantages, as might be shown were I intent upon entering minutely into the subject.

Such are the advantages of this form in individual buildings; such as are unequalled in general by other forms for strength, beauty, and convenience.

Nor are the advantages of this form confined to the individual structure, but extend to general and even universal use; analogous to other cases physical, moral, and political, in which that which benefits the individual is also good for the many.

First, then, as to its general use, a circle of circular houses (fig. 4.) has the following advantages:

That this arrangement of buildings, in common with the individual, is stronger than any other.

That, as there are certain proportions of height to the diameter in individual structures which best satisfy the demands of taste, and are called harmonic, and as in towns and cities the value of horizontal space is such as to occasion houses to be built much higher than those which stand detached in the country, so the diameter of these circles would enable us to carry the individual houses to a great height with much solidity, agreeably to these demands of taste, in one uniform

uniform design susceptible of great variety, beauty, and grandeur; the interior forming one magnificent amphitheatre.

That each house of the circle, touching only in a point, would require no party walls (Euclid, book iii. prop. 13), yet would be more secure from fire, as engines, &c. could reach a much greater surface of each edifice than in lines or streets of square-formed houses.

That each house would be better lighted and ventilated than in any other arrangement, and would have a better and more extensive view and front, advantageous to the trading part of the community, and agreeable to all.

That as the purpose for which men assemble in towns and cities is social intercourse in business and pleasure, so of all forms in which dwellings can be arranged for the purposes of *society*, that here pointed out is not only the strongest, most commodious, œconomical, and beautiful, but also the least *solitary*; each house being within sight and communication with every other of the circle, at the same time that privacy and distinctness are sufficiently provided for.

That a building or buildings around a circular court or mews in the centre, may become the offices, stabling, &c. of each house, and one common receptacle and sewer may receive and carry off the filth from the drains of each house, and these at a point the furthest distance from each, the sewer running under the passage by which the court or mews communicates with the exterior of the rotundo, so to call this circular arrangement of houses; while, on the other hand, water may be supplied very œconomically either this way or externally to each house.

Without entering minutely into the arrangement of circular houses in other forms, I shall merely mention, that, with many of the foregoing advantages, they may be distributed in rows, streets, or squares, the angles of which would be all rounded off, and the same of gateways, &c., and the beauty of which may be easily imagined.

Finally, this form is capable of universal application in the distribution of cities, with the individual and general

advantages already pointed out, together with utilities of a more extensive nature, as follows, demonstrable by fig. 5, in which these circles of circular houses are arrangeable in circles of a higher order to infinity.

It is evident, then, by inspecting the diagram, without resorting to abstract principles, that from every circle thereof there is a straight road to every other circle of this city: hence the quickest possible intercourse and uninterrupted communication with its most extreme parts; hence public drains and water-courses, lighting and watching, &c. may be conducted upon the most efficacious and œconomical plan possible, advantageous to the individual and community; and hence the freest circulation of air, health, and order, there being no place close or obstructed—no lanes, courts, and alleys, scenes of filth, disease, and immorality.

As to public buildings, such as palaces and offices of government, colleges, churches, and almshouses, theatres, prisons, forts, &c., the first might occupy a grand circle in the centre of the city, of a proportion and magnificence worthy of the whole; the rest might be distributed in other parts of the city, according to their nature and convenience; and it might be shown, and may be easily conceived from what precedes, in what manner the circular form is best of all adapted to their respective purposes: in fine, it were an offence to common sense to extend this description to the further uses and variations of this plan.

On the other hand, I am aware of the opposition which may be urged against it by long established prejudice to the square form; the adaption of habits, tools, materials, and instruments, to this latter form, by which circular work is attended with difficulty and expense in nowise natural to it; the outcry for picturesque beauty and variety where mechanical beauty, viz. simplicity and uniformity, only should be demanded by true taste; yet the charge of sameness is more applicable to the lineal form of streets and squares, while this plan is susceptible, without disturbing it, of variations in the dimensions and ornaments of its buildings

suited

suited to the various classes and ranks of society; and the beauty, variety, change, and infinite extent of view, either standing or moving, in such a city, may easily be imagined: but as this plan is *general*, and all objections that may be brought against it are likely to be *particular*, they cannot legitimately oppose it.

To end, then, at the point of coincidence from which I departed, the distribution of this city is into hexagons, according with the natural arrangement of the forest pointed out by the author of the ingenious paper I have quoted; to which may be added, that the circle is the form indicated by nature, and instinctively followed by inferior animals in the construction of their habitations, and in the huts of infant societies, as those of the Caffres, who observe this form not only in their individual habitations, but also in their kralls or villages.

Thus I have described the individual, species, and genus of my plan, advancing from the lowest to the highest; and lest some readers should conclude that I am, like certain modern politicians, so giddied by turning in a circle and disposed to whirl all things together in my vortex, or, in other terms, so blinded by a system as to recommend seriously the universal adoption of a perfectly uniform plan, to the exclusion of long established customs adapted to the disunited and imperfect state of man, I must declare, ere I take my leave, that the purpose of this essay is merely to sketch a speculative model for the excitement of thought, and from which the artist is at liberty to select, to reject altogether, to recompose, or vary to his purposes.

G. Field.